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Volume 4 Number 12

December 1995

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## Stuff for Christmas

**Cold water and clocks**  
Inside the motherboard

**Pentium shopping**

**4 tools to tweak Win95**

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  - Microsoft Office 4.2 application
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Steps PC also says its Virtual Flighter Series game is now available in a bundle with a multimedia accelerator from Diamond Multimedia.

Says a PC games are compatible with Pentium PCs running Windows 3.5.

### Outscape Completes Desktop Buy

For \$1.5 million a week, web browser publisher Netscape Communications Corp. has completed acquisition of desktop field Catalyst Software Inc., a product of a groupware program that integrates with Lotus Notes.

### New Storage Plans Researched

High-speed telegraphists store storage systems holding priority corporate information of today's largest companies. In fact, data drives are the goal of a new research initiative by the University of Dayton's Research Institute, R&D, Stanford University and others.

In Dayton, Ohio, university's R&D unit United Press International the personal applications are numerous ranging from scientific communications to high-speed digital libraries.

They noted that for optical storage systems could hold more than 10 times the volume of today's largest magnetic hard disk drives and maintain data input and output rates more than 10 times faster than tape systems.

Nancy Gustafson, UM&I senior research scientist and an associate professor of telecommunications, claimed, saying, "In the future, we will

increases around that kind of data would be across a range of data. These systems have up to date data in a transparent and are designed to enable optical performance in the optical data room data."

Gustafson notes that telegraphists store storage units have to store information on "pages" of electronic pages within the volume of the optical optical crystal. Because a million or more data bits are placed on multiple and thousands of pages can be stored in a single line larger than a small coin, he said, telegraphists systems offer the possibility of storage devices holding volumes of bytes of information.

Also, since there are no moving parts and all the information on each page is accessed simultaneously the technology also has the potential for very rapid access to any of the information in periods more than 10 times faster than tape systems today.

### Big Business Highway into the Web

Slightly more than half of the world's 80 largest corporations — 34 percent — have established a corporate presence on the Internet, a World Wide Web and increasing their sites to increase a variety of information to their key customers, according to a review conducted by the New York office of Krollman Patten Belton & Nordstrom.

Krollman notes that 27 of the world's top 50 corporations have established Web sites. Among the largest corporations, including in U.S. corporations, three and German sites in a British-German company and one in Japan.

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NMB Technologies Inc., the highest volume keyboard manufacturer in the world, joined with SBC's Labs, a leader in audio technology, to produce the Right Touch™ Concert Master™ multi-speaker keyboard.

SBC's technology, Sound Activated System, produces three-dimensional sound effects from any audio source with just two stereo speakers. The keyboard features SBC's 3-D system which creates a surround sound experience and brings all sound effects directly to the keyboard. This includes volume, mute, SBC's new scroll, side built-in microphones.

The ConcertMaster keyboard features 3 side jacks for headphones, an on-board and detachable allows any multi-effect, such as external speakers, to plug into the keyboard, includes an integrated standard speaker system with 500 watt amplifiers is compatible with all soundcards and personal audio devices, includes 4 new keys for the Windows® 95 screen keys for applications, left Windows, and right Windows. The application key brings up the current pop-up window at the current active position. This is the equivalent of pressing the right mouse button in most applications today. Pressing the application key will not disturb the current mouse pointer position. The left Windows key are focus to the Windows 95 user interface. The right Windows key has the same functionality as the left Windows key.

The keyboard incorporates a power slide switch which allows the user to turn on applications or internal microphone without affecting the keyboard's functionality. It has a simple and easy to use construction.

The SBC's 3-D system from stereo and traditional sound expansion techniques. It is based on the human hearing system. It increases the spatial information from soundcards and retains the original three-dimensional sound field. As a result, the reproduced sound is much closer to a live performance.

ConcertMaster is 100 percent compatible with 286 or higher processors, Novell Netware, DOS, Windows 3.1 and Windows 95. NMB Technologies Inc.



received Microsoft Compatibility Lab® approval. ConcertMaster has been approved for logo usage by Creative Labs SoundBlaster compatibility. The Right Touch ConcertMaster keyboard is available for the 1995 holiday season through Ingram Micro and Alpha Electronics and various outlets. The manufacturer's MSRP is \$199.95 street pricing could be as low as \$139.95.

For more information, contact NMB Production Inc. at (504) 998-0321.



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## Supernov pulls down BC New Canadian Entrepreneur Award

Supernov, Vancouver operation, won the 1995 BC New Canadian Entrepreneur Award in the Marketing Category. It was voted by the industry as the number one distributor of computer products in the country. Supernov earned it by providing their customers with top products, highly skilled technical support and by their ongoing efforts to understand the needs of the market. Charles Lee, General Manager, started the Supernov Vancouver operation in 1985. The company has grown rapidly. In July, 1993, the company introduced its ISO 9002 Certification. Charles is one of the founders of the National Canada Computer Distribution Society. He is the current president of the NCCDS.

Supernov is one of the largest computer product distributors in Canada. The company distributes over 1,000 products from over 1,000 suppliers across Canada. It is headquartered in Markham, Ontario. The company is currently setting up its Montreal sales office to serve the Quebec and Eastern markets of Canada.

Last December 17, 1994, Supernov was selected by the Financial Post as one of Canada's 50 Best Managed Private Companies. □

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 Byte Magazine rated "The Sounds Multimedia Platinum Notebook, 'Best Overall,'" stating it "stands in overall performance.... we awarded the best value quality to Sounds."

 PC Report also rated the Sounds "Number 1 Overall" with a 4.4 star rating.

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## Buying a Pentium

**Journal of Management Education**

**Y**ou want to buy a Pentium. You want to know what kind of Pentium to buy and where to buy it. I have recently become the proud owner of a Pentium. My story may help you.

First, I made a list of specifications. At the top of my list, I put Flash 8000. The Flash built-in operating system allows a user to upgrade the computer's functionality, if the manufacturer recommends it, without replacing any hardware. The user can upgrade by using the manufacturer's software. The Intel Test Center uses a Flash 8000.

Here, I considered how much RAM I should buy. Microsoft says that one can run Windows 95 with 4MB, but of course, 4MB. The Word for Windows 95 packaging says that Word needs 8MB. The packaging for Works for Windows 95 says that it can make do with 4MB but recommends 8MB. In a manual for Word for Windows 95, Microsoft states that if one wants to use Word as an e-mail editor, then one should have at least 12MB of RAM. Configurations of 8MB and 16MB are common. Explicitly says that more is better. To be certain that my computer would never dwindle in processing my commands, I added in my specifications that I should be able to add 8MB up to 12MB, the most common degree of expandability offered. A couple of months ago, that would have been the end of the matter, but now not most due to the snafu of the RAM that one buys. (One can want plain, vanilla RAM, or one can want the ones that are, referring to EDO-RAM [extended data out RAM] meant the company's processing speed up ten-fold. (Picture the bracketed [pages] from the plain RAM's processing speed. This increase in speed means, of course, that EDO-RAM costs a little more than ordinary RAM. Moreover, EDO-RAM requires that the computer have a chipset that supports EDO-RAM, and that the component cards equipped with a "pipelined burst cache." Without the special cache, the computer will not make optimum use of the EDO-RAM. The pipelined burst cache can synchronize SRAM [static] rather than asynchronous SRAM [dynamic] in keeping the contents most recently used in RAM. The cache thereby speeds up the

computer's processing. The cache comes in two sizes: a private 256KB and 512KB. I read somewhere that 512KB makes sense only with a system that uses X86-RAM or similar. The pipelined burst cache is, of course, as nice as it is. The two chips that support X86-RAM, at the moment, are the Intel Triton and the Symphony Series. I specified the Intel Triton because most manufacturers are offering it.

After making my changes with regard to RAM, I installed graphics adapters, also known as graphics accelerators or video cards. The video card is responsible for the display and presentation of the images on the screen. The card may be 1D, 4D, 64-bit, or 128-bit. It may use DRAM or VRAM as EDO VRAM or WRAM. Common configurations are 1MB or 2MB of RAM. Users who intend to run demanding graphics or design programs may opt for 4MB and beyond. As one moves from 32-bit to 128-bit, the price increases. As one moves from 1MB upward, the price increases. As one moves from DRAM up to VRAM, the price does not necessarily increase but performance will. DRAM does not easily store bit information; it allows additional video RAM to be added at the user's discretion later than he or she wants better performance. The newest 64-bit cards provide full-motion video; that is, they can play video in thirty frames per second, fast enough to resemble television. With additional hardware or with the appropriate software, the new 64-bit cards will play MPEG movies (as CDs). The Matrox MegaMillennium (VRAM) provides built-in, 3-D, hardware acceleration. Some cards offer such features as on-the-fly resolution-changing, zoom, and the virtual desktop. I made my choice of video card with regard for the reports in the magazine and upon the assurance of my manufacturer that it would "support the card" in Windows. I suspect that the buyer of a video card pay attention, beyond plug, speed, test features, or whether Microsoft has certified the card to be Plug and Play, whether the card's manufacturer provides software that will work with Windows 95, and whether the card's manufacturer has a good reputation for service. I will say more about on-screen location.

I wanted an IMB of VILA61 or VILA61 as being best for my purposes, and wanted you to discuss a possible

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Monitors come in sizes 14, 15, 17, and 21. They should be non-interfered (NFI) and warranted for at least three years. They may have a dot pitch of 28, 21, 24, or 25. The 21 provides the sharpest picture, and, you guessed it, is the most expensive. The road to monitor is toward Play and Play, you connect the electrical cable, turn on the computer and the monitor and everything works. With monitors the user's principal consideration is the appearance of the screen. The screen's appearance depends, first, on its vertical refresh rate, that is, how many times per second the monitor redraws the screen. The Video Blayne is Standards Association recommends a standard of no less than a 72 Hz refresh rate at any resolution. A refresh rate below 72 Hz causes the screen to flicker. The screen's appearance depends, second, on details such as brightness, contrast, alignment, and convergence. I depended on the manufacturer to tell me which monitors produced the best image. I was also concerned about the amount of radiation that a monitor might emit. I learned that monitors with devices to reduce radiation are rated as either MPR II or EBC, EDC (being a similar standard). Finally, I paid attention to the numerous commentators who say that a 17" monitor is the only way to go. The problem with smaller monitors is the clutter produced by the close assembly of windows, icons, toolbars, and the like that the user creates when he or she opens several applications at once. The problem with 17" and 21" monitors is their cost and their weight. They are heavy beasts!

Having decided what monitors I would consider, I put an E3000 to 1GB hard drive in my list of specifications. I specified that the hard drive should not have a greater than 10 millisecond seek time. None of the less expensive drives dwindle taking 10 and 12 ms as their seek times. Someone who wants a computer for correspondence and a few games might find a 540MB hard drive and a slow seek-time adequate. I made my decision taking into account, first, the rule that one can never have too large a hard drive. Second, I noted that the cost of a medium capacity drive is not much greater than the cost of a smaller hard drive.

Next on my list, I put a quad-speed CD-ROM. I could have selected a double-speed CD-ROM but the reports are that the double-speed is a ringer. The quad-speed has good performance at a tolerable price. The example-speed is fast and expensive.

To complement my CD-ROM drive, I selected a 16-bit sound card. A Sound card, the 16-bit card is available but for the high-priced, the 16-bit card is a good performer. The user who wants to have access to the greatest wealth of software for the production of music should choose that the sound card which he or she selects is Sound Blaster compatible. Sound Blaster is the industry's standard. If the user wants to connect a keyboard, he or she should also want to know whether the card has a MIDI interface. The speakers that radiate off as part of their multimedia kit are apparently adequate.

Next, I put a 17" multi-master with 33MHz power supply on my list. I have observed that some come as mini, mini, and full size, and with power supplies

Next, I put a 17" multi-master with 33MHz power supply on my list. I have observed that some come as mini, mini, and full size, and with power supplies

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# V-COM Offers Custom Configuration Guide

If the choice between an off the shelf computer package and a system configured for your exact needs has you a little confused, then a visit to V-Com Computers is a definite must.

You've read all the books, visited all the magazines, talked to the neighborhood guru, and even asked the annoying guy at the office, and you know that a custom configured PC will be the best choice yet what do you do now...

## *In the Custom Configuration business for over 13 years*

Free net, V-Com Computers, at the corner of Marine Drive and Kerr in Vancouver, has been in the custom configuration business for over 13 years. From the color of your case to the speed of your internal Cache, you'll be taken on an informative guide to your ultimate choice.

Custom configuration opens the gateway to real performance value. Let's be honest, all that bundled software in the package is not free—it may be discounted, but it does cost you, and if you don't really need it, spending that money on a faster modem or faster video card will be of greater value to you when you start surfing the Internet, or working on Windows 95.

## *The Ideal Consultant Based Approach*

V-Com's retail layout is ideal for the consultant based approach required to put together the perfect PC for each customer. A large openware showroom area, a second and even more to compare systems and monitors, sit down - hands on display models of the PCs and optional accessories stations. Custom configuration doesn't cost more money yet does take a little time. V-Com consultants are ready and willing to go through each step, option, in easy to understand, real life language (no techno-babble).

## *Education and information*

To purchasers with a limited knowledge of computers, you'll leave V-Com educated, informed, and confident in your quest for the perfect PC. To purchasers that are technically literate, you will appreciate the level of knowledge and product awareness that V-Com consultants bring to the table.

Let's face it, we also need to know about the stability of the company that is going to provide the PC. Even though the manufacturer's warranty are always there, we need to consider the overall service issue. V-Com has been in business for over 13 years, is a subsidiary of a large international high tech company with offices in Vancouver, Prince George, Calgary, Toronto, Halifax, and 2 locations in the United States, and has a buying office in the Far East.

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# Desktop Publishing Tips:

## Corel PHOTO-PAINT 5.0

Steve-Sam Tan

**P**HOTO-PAINT'S retouching tools enable you to alter parts of the image. Some of the tools are also available as filters.

Start Corel PHOTO-PAINT and load an image. You select the retouching tools from the Toolbox. It's a good idea to save the image in raw experimenting with the tools. You can Undo each stroke as soon as you complete it and before you make another stroke.

### Tinting

Tinting paints a plane of colour over the image. Use it to add detail or tone down parts of the image.

Click the Tint Tool in the Toolbox. In the Tool Settings roll-up, choose the tint. Size and the density of the Tint. In the Color roll-up, select a tint colour. Pass over the image with the Tint Tool.

To test a grayscale image, click the Alpha, Channel Tool, and select a colour channel. Paint with the Tint Tool using colours selected from the Color roll-up.

### Blending

Blending smooths edges by making colours "mix". It creates shades of the adjacent colours.

Click the Blend Tool in the Toolbox. In the Tool Settings roll-up, choose the tool Size. Choose a Blend value. The higher the number, the more the colours will mix. You can also drag the slider control across the scale.

Drag the Blend Tool over the image. Each pass of the tool will increase the amount of blending. Zoom in to see the effect.

### Sharpening

Sharpening increases the contrast between colours by darkening the edges of dark colours, and lightening light colours. It creates outlines, producing an apparent effect to blending.

Click the Sharpen Tool in the Toolbox. In the Tool Settings roll-up, choose a small tool Size and set the Sharpen value. The higher the number, the greater the contrast. You can also drag the slider control across the scale.

Drag the Sharpen Tool over the edges of colour areas in the image to create outlines.

### Seamless

Seamless spreads a colour into uniform colours.

Click the Seamless Tool in the Toolbox. In the Tool Settings roll-up, choose the tool Size. Click the Edge drop-down list. Choose both for a feathered edge. Enter a number for Density. The higher the Density, the more the selected colour will spread. Enter a Transparency value. The lower the Transparency value, the more the selected colour will cover other colours.

Drag the Seamless Tool in the image. Start in one colour and stroke outwards from it.

### Smudging

Smudging mixes colours by smearing pixels randomly.



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Click the Smudge Tool in the Toolbox. In the Tool Settings roll-up, choose the tool Size. Set the Edge, high Density, low Transparency and high Rate of Flow will increase the smudging.

Drag the Smudge Tool over the image.

About the author: Steve-Sam Tan is a freelance graphic artist and desktop

publisher who provides training and consultation in CorelDRAW, Corel PHOTO-PAINT, Corel DRAWING, Microsoft Graphics, PageMaker and WordPerfect. If you are using CorelDRAW, Corel PHOTO-PAINT, CorelDRAW or Corel DRAWING call for information about purchasing. Move to desktop is a collection of desktop publishing tips. Telephone: 774-1940

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**How much will the Pentium Pro processor cost?**

Intel hasn't yet disclosed actual pricing.

**When will Pentium Pro processor systems be available?**

The Pentium Pro processor will arrive in late 1995, and Intel expects that Pentium Pro processor-based systems will be available from a variety of system manufacturers at that time.

The Pentium Pro processor looks different than other chips. Will a Pentium Pro processor fit into a Pentium processor socket?

No, the Pentium Pro processor has a quite different form. A Pentium processor box is not designed to be put compatible.

The component box of a Pentium processor is designed to interface to an external L2 cache and includes features to optimize CPU-to-cache data transfer. In contrast, the first Pentium Pro processor includes a 256KB L2 cache on the same package and the CPU communicates with an L2 cache using a private internal bus. The component box of a Pentium Pro processor is designed to interface to a cache external memory bus and includes features to optimize data flow to memory data transfers.

**The Pentium Pro processor package looks very expensive — is it?**

The Pentium Pro processor is manufactured using the same silicon processing steps and the same packaging steps as today's 100MHz Pentium processor. The package does have two cavities which makes the package 40% larger than the Pentium processor package, but this is only a small cost increase in raw materials. Both do not simply have bonded into their cavities and are coated between these cavities using standard pin-grid-wrap packaging techniques.

**What about the thermal and electrical specifications? How hot will it run? At what voltage does it operate?**

Power dissipation is proportional to the speed of the processor and the square of its supply voltage. The first Pentium Pro processor operates at 133MHz with a supply voltage of 3.3 volts and dissipates a theoretical peak of 28 watts. However, power dissipation for all processors also depends on the software being executed. For more typical patterns of code, power dissipation for the Pentium Pro processor averages around 14 watts. Operating Temperature Range (CPL) was chosen for the Pentium Pro processor has signaling voltage even this is independent of processor voltage and more difficult voltage timing, enables faster operation.

**What kind of performance can I expect from the Pentium Pro processor?** The Pentium Pro processor's performance is estimated at 200 SPECint92 or 133 Mflops. For comparison, the 100 MHz Pentium processor will deliver 121.8 SPECint92.

Color Pentium Pro processor performance numbers will be released later this year.

**What are the advantages of an on-package L2 cache?**

Having the L2 cache in the package not only simplifies system design and saves space, it also ensures the CPU can communicate with the L2 cache at full speed. Additionally, the cache is non-blocking which means that transactions on the Pentium Pro processor bus don't wait the processor to block subsequent bus trans-

actions. For example, when a cache miss occurs, the Pentium Pro processor continues to process other transactions while waiting a bus transaction to satisfy the cache miss. These instructions could generate additional cache misses which could cause more bus transactions. The Pentium Pro processor can maintain up to four of these outstanding transactions.

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Will multi-processing be used with the Pipeline? [Yes](#) [No](#) [More...](#)

The Pentium Pro processor has been designed to support multiple Pentium Pro processors connected in parallel. The Pentium Pro processor component has a symmetric multiprocessing bus and includes full support for the MMIO protocol. **Global Win** MP Pentium Pro processor systems feature a cost-effective, yet, powerful

dit metal system logic is required for multi-processing, since the Pentium Pro processor includes all of the logic required to directly support the interconnection of up to four Pentium Pro processors. This means that it is very easy - and cost-effective - for system designers to include multiple Pentium Pro processor processors, essentially by just providing sockets for the additional processors.

Is there a new instruction used by the Pentium Pro processor? What does it do?

A conditional move instruction was added which may be used by compiler writers as an alternate to a "test and set" construct.

This allows a debt-dependent branch to be eliminated. The resulting code will be more predictable by the processor and will thus deliver higher

**Abstract** **Keywords:** *emotional intelligence, social skills, self-regulation, self-awareness, social skills, self-regulation, self-awareness, social skills, self-regulation, self-awareness*

Internal evaluation of floating-point performance is still ongoing, so Intel hasn't yet released numbers.

Is the Pentium Pro processor a 64-bit processor? Does it support 64-bit integer instructions?

**Mo:** Like all Intel processors since the Intel386 processor, the Pentium Pro processor is a true 32-bit processor. The general purpose registers are the same as on previous generations of Intel Architecture processors and the instruction set is supported with only one new instruction being introduced.

However, there are a variety of wider datapaths both inside and outside the chip. One wider feature that is common is incorporated in that the Pentium Pro processor, like the Pentium processor, has an external data bus in order to communicate more efficiently with system memory. This wider external datapath increases bandwidth between the Pentium Pro processor and the system, but doesn't make the Pentium Pro processor a data machine.

The Pentium Pro processor has about 21 million transistors in total. Does this put the Pentium Pro processor at a cost disadvantage? Is it difficult for manufacturers?

Mo: The Pentium Pro Processor (CPU) can  
run 3.3 million instructions, and the L1  
cache contains 1.5 Mbytes.

The main disadvantage for powder manufacturability and cost is the die size which is in large part a result of the process technology that the product is manufactured on. The First Partisan Process can still be built on the same high-volume process as today's mainstream Partisan processes. Some (and will begin some)

Introducing the Postnom Pro processor processor as a new 8144 microprocessor which is already in use today. In other products. While making even higher clock frequencies and higher performance, this also makes the Postnom Proprocessor's design much smaller and easier to manufacture.

The 11.5 million number for the U.S. is also somewhat misleading. Since the U.S. is a very regular uniform structure the transmission may be placed more closely together, it is relatively small the

W<sub>0</sub> is the L2 weight constant, which determines the maximum value of the CPM cost. The value is actually smaller than the maximum. (See Appendix A.2.2.2.)

[illegible]













Some chips return only one bit of data on one pin, while other chips return 4 bits of data on 4 pins.

Ordinary PC memory uses Dynamic Random Access Memory or DRAM. Typically, such memory is rated to respond in 40 to 70 nanoseconds. A smaller amount of memory may be added to the system as an "external" or

"second level" cache. This is made of faster Static RAM or SRAM. External cache is nice if you get it, but it may not be worth the trouble to purchase and install it yourself.

DRAM is typically packaged on small boards called SIMMs. Each memory location holds 8 bits of data (a byte), but the memory also maintains an

error bit to serve as a parity error check. Memory does not fail often, but when there is a problem it generally affects all the data in a chip. The parity check detects the error. The system will crash, but the diagnostic error at power up indicates which SIMM needs to be replaced. (Check the amount of RAM checked to determine which chip has failed.)

There are two types of SIMMs in wide use. An older shorter SIMM has 30 connections that transfer information between it and the main board. This type of SIMM transfers one byte of data (plus parity) in each memory cycle. Since a 4-Mb chip needs to transfer 4 bytes of data, the 30 pin SIMMs are installed in groups of 4. The 30 pin SIMMs are typically sold with either 4-Mb or 8-Mb of memory. A group of four 8-Mb SIMMs provides 32-Mb of memory, while a group of four 4-Mb SIMMs provides a 16-Mb upgrade.

New machines today use a longer SIMM with 72 connections. This allows the SIMM to transfer a full 4 bytes of data (plus parity) in each memory cycle. On a 4-Mb component, the 72 pin SIMM can be installed much more easily. Generally, these SIMMs are sold with 4, 8, or 16-Mb of memory. Some of the 72 pins indicate to the main board how much memory is on the SIMM and what speed (10, 15, 20 ns) the memory operates at. The 72 pin SIMM is becoming standard because it can be installed individually by used as more backup.

The more powerful systems (Pentium, PowerPC, DEC Alpha) can finish 64 bits (8 bytes) of data from memory at a time. On the high end 486 server models, the memory is "interleaved" and operates on a bit bus. In either case, a high-end system may require 72 pin SIMMs installed two or three at a time. There is a new SIMM standard calling for a 144 pin configuration that supports a 64 bit data path. It is found in some models of the PowerPC but is not expected to make an impact on the marketplace for a few years yet (Don't hold me to that).

There are two ways to build a 16-Mb SIMM using the older 30 pin technology. The first is to use three 4-Mb chips and one parity bit. The complete system uses 4 chips, each holding a portion of data, each delivering one bit of data on demand through one pin. However, as 4-Mb chips become more common, some vendors created a three-chip SIMM by packaging two 4-Mb chips (each delivering 4 bits through 4 pins) and a 1-Mb chip (delivering 1 bit through 1 pin). The general recommendation is to use only one type of SIMM in a system.

The cheapest system units and a number of the replacement manufacturers have memory slots that use 30 pin SIMMs. This is becoming an obsolete technology and should be avoided where possible. The manufacturers are marketed from major vendors all

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use the 72-pin SDRAM technology and this should be preferred

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## Happy Up and Wait

Data travels between the CPU and memory on parallel wires called a "bus." These wires contain the clock or beat, address bits, data bits and control signals. One of the control signals is called ready. The CPU is the fastest device on the main board of the computer. It has to be slowed down to match the memory and I/O device speed.

Every bus operation begins with a new clock tick. If the CPU needs data from memory, it places the address of the data on the bus. The 386 or 486 bus is not designed to respond to the same cycle that the address is presented. The

minimum bus operation takes two cycles. At the end of the second cycle the CPU checks the value of the ready wire. If the data was found in 35 ns SRAM cache, then ready will be active and the CPU reads the data. Otherwise, ready is inactive and the CPU waits for another clock cycle.

Each clock period that ends with the ready wire inactive is called a wait state. No matter what the vendor says, there is no such thing as a high speed machine with 0 wait states. The processor speed is less fast and DRAM is too slow for that to be possible. Wait states are also introduced by I/O devices to they need more time to process data.

## A Cold Shower

Turn on a shower first thing in the morning. The water comes out cold. The shower has to run for a minute before it gets hot. Just how long the delay is depends on pipe diameter and distance the pipe is between the water heater and the bathroom.

The same problem occurs in electronics and is called capacitance. Turn on a main, and it may take a second before any music comes out. The capacitance of a PC main board is tiny compared to

a main, but it is significant when time is measured in nanoseconds (ns).

The Intel and AMD CPU chip manufacturers claim a delay between the clock tick and the time that the address reliably leaves the CPU. The main board adds several nanoseconds while the address flows through the circuitry to the bus memory system. There will be a similar delay when the data value travels back from the memory chip to the CPU. The engineers who design the main board take this into account and program wait states to handle the worst case.

The engineers build a main board rated for a 30 MHz (30 ns) clock, 70 ns memory, and one wait state. Since there are two clock cycles in addition to the wait state the memory reference operation is 3x30 or 90 ns. The memory responds in 70 ns, so there is an additional 20 ns for the signal delays on the main board.

Most main boards are designed with a specific number of wait states for a specific memory speed. A board designed for 70 ns memory can be populated with 60 ns memory instead. It will wait 70 ns for the data (plus any

overhead for the signals to travel out and back).

Notice the memory on the CPU know how long the main board delays will be. The water heater does not know how long it will take for the hot water to reach the bathroom, handling a larger water heater, or turning up the thermostat on the current heater, will not reduce the amount of time it takes to run the cold water out of the pipes. Using better memory does not change the main board design. The speed by which the CPU references memory is determined by the clock rate and the number of wait states inserted waiting at writing memory.



## Cash in your Chips.

About thirty years ago, IBM demonstrated that a mainframe computer could run faster if it had "cache memory." The cache is a high-speed memory area that keeps a copy of the most recently used data in main memory. Most programs go back and re-examine the same instructions, or update

the same numbers, and the cache provides better performance.

A modern PC has two levels of cache. The 486 family was designed with 8K of memory inside the CPU itself. This is the best type of cache, because the circuit inside the chip can operate much faster than any external data reference. When adding two numbers together, the

486 can perform the operation in two internal clock cycles (which would be required in one external clock cycle on a 1000 that "kisses" the main board clock) provided that both numbers are already inside the CPU chip.

An external or "second-level" cache can be installed with SRAM chips on the main board. SRAM runs faster than

DRAM, but a still is slower than the first level cache in the CPU. The add operation requires two internal clock cycles, and two additional external clock cycles, of the data is in the second level cache.

Because it is relatively expensive for the CPU to access an external memory reference, and because there is a high probability that the next number or instruction needed by the program will be the one immediately following the last number or instruction, the 486 is designed to fetch data from memory in a "burst." The internal cache is arranged in units of 16 bytes. Each unit is called a "line" of cache. Whenever an instruction references data that is not in the internal cache, the chip generates a memory reference for the first bytes of needed data, and then fetches the remaining 12 bytes of a 16-byte memory area.

When data is found in the SRAM second level cache, there is one external memory cycle to set up the transfer, then the four bytes needed for the current instruction come in on the second external clock cycle, and the remaining twelve bytes come in on the next three clock cycles. After four main board cycles, all 16 bytes have been moved into the chip. Without the burst, an old 386 would have used eight clock cycles to fetch the same data, since each individual four-byte byte would have required two cycles to set up the transfer and one cycle to receive the data.

If the data is not in the SRAM second level cache, then it must be fetched from ordinary DRAM memory. DRAM typically requires at least 70 ns for each response, and that is two or three external clock cycles. In fetching the data from DRAM involves "wait" states where the CPU has to stop and wait for the memory to respond.

## Interleave

In the same period that processor cycle rates had dropped from 100 to 20 ns, memory speed has only dropped from 100ns to 40 ns. With a 100-nanosecond cycle time possible, memory response becomes a problem. Mainframe designers addressed this problem twenty-five years ago by "interleaving" memory.

A 486 chip has 32 data pins. It references memory four bytes at a time. Main gain boards simply connect the CPU pins directly to the memory sockets. But the main board can achieve higher performance if it creates a wider path in memory. Interleaved memory has two sets of sockets and two 32-bit

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(Continued on page 44)

# New Heights for On-screen Gambling

— Review of *Celebrity Poker*

David Anderson

Card games on the computer are by no means new. I remember getting wrapped up in a simple Blackjack game on an Apple IIa many years ago. The fascinating thing about virtual gambling is the way the computer program can actually teach you how to play a card game. Since the money means nothing, you can do things you would never do in real life.

*Celebrity Poker* invites you to join a friendly game of poker with three Hollywood personalities: Jonathan Demme, her Patsy and Morgan Fairchild are bright, peppy, engaging, and full of encouragement as they welcome you to their card table. There is even a menu command that compels Joe Patsy to tell jokes if you need some instant humor during the game. If you join all three, they will start to needle you to play. There is a hint to their personas, even though they are only video images. They do have other things to do, it seems.

*Celebrity Poker* contains a rotating list of common poker games. You can choose the game you like to play, or let the dealer choose for you. You have chips to bet and to bet with, and your chips appear in front of you at the bottom of the screen. The game controls are very intuitive and the manual is only required if you need help understanding the various high-card and low-card versions of poker. The single games are designed to prepare you for a poker tournament, in which your results are tallied for a series of poker games, with big winnings for tournament champions.

Technically, this CD-ROM was a pleasure to use. It snuggled through my year-old 486 (DCL), and told me to use the low-graphic video option, because of my slow IDE bus and my ancient Pentium. I double-speed CD-ROM drive. The even with slow equipment, the game played flawlessly. I did not get to see the higher-performance options, called "ultra-turbo video." On my machine, Morgan, Joe, and Jonathan took turns talking and moving. This was sufficient, however, to enjoy the action, and participate fully. When I cranked up the game settings, the video action left trails all across the screen, so I didn't focus the most any further. As someone once said, you get what you get.

The nice thing about this CD-ROM is the way the video and sound does not get in the way of the main activity, which is betting, bluffing, raising, calling, and winning. It makes a perfect gift for your poker-playing year list. In spite of the rather lightweight Hollywood personalities, the game plays very well, teaches a lot about poker, and lets you spend endless amounts of money trying to be the best poker player around. A great program for a rainy night. ☐



## Product Information:

New World Computing  
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About the author: David Anderson is Vancouver elementary teacher parent of two children. He can be reached by email: [computer\\_players@newlink.bc.ca](mailto:computer_players@newlink.bc.ca)



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what you click on the text or previous page of the book can only locate comments will be displayed.

## Mailing Labels

Mailing labels are a snap to produce with FileMaker Pro.

In Layout mode you select "New Layout..." from the "File" menu. Here you are presented with a dialog box containing several options including Labels. When you click the Labels radio button the Label Setup dialog box is displayed. Here you can choose from a list of more than 30 standard Avery labels (even to find the exact size and shape of label you prefer).

Next a field list appears from which you select the fields you wish to appear on your labels.

When field selection is complete a click of the "OK" button sends you to layout mode again. This time a representation of your label is on the screen. You may move fields around and add descriptive text (just as you would when creating a data entry form).

When you are satisfied with the appearance of your labels, simply choose File>Print.

## Ready-to-Run Applications

FileMaker Pro 3.11 Deluxe ships with over 20 ready-to-run applications. Some of these pre-designed solutions include:

A Contact Manager to keep track of existing and prospective clients.

A Lead Tracking Manager which shares files with the Contact Manager. This allows you to follow up on all your leads.

The Expense Manager organizes and tracks all your expenses. You may assign any fee for you'll know where all the money is going.

The Service System allows you to track sales while providing professional-looking invoices.

Some of the other ready-to-run applications are:

- Project Manager
- To Do List
- Home Budget
- Personnel Records
- Job Search Database
- Buy vs. Lease Analysis
- Asset Management
- Employee Leave Form
- Job Application Form
- Home Inventory
- Party/Wedding Planner



These applications are easy to modify to suit your own particular needs, and provide excellent examples and ideas you can use to produce your own professional-looking forms and applications.

## Cross-Platform Issues

FileMaker Pro is exceptionally well-tuned to offices which have both Macs and PCs. A Mac user needing to use a PC will find at home with FileMaker and will pick up some of the quirks of the Windows world.

FileMaker Pro imports and exports dBASE, Lotus Paradox, ASCII text files and several other file formats. This is handy when a FileMaker user wants to work with data created by another database application, perhaps to create a mailing list or a summary report. Unfortunately, even FileMaker data cannot be shared by other database products. Changes made to a record in FileMaker are not reflected in the original data file.

FileMaker data files may be shared across a network with other FileMaker Pro users using other PCs or Macs.

The ability to share data between a Mac and a PC using a common interface is significant in a mixed-platform environment.

## Requirements

Minimum requirements are a 286-based processor (1680K or greater recommended), three megabytes of RAM (4MB recommended), IntellMouse<sup>®</sup> Mouse 3.0 or higher, a VGA video adapter, a hard disk and one floppy drive.

## Conclusions

FileMaker Pro 3.11 is an easy-to-use database manager ideally suited to home or home-office work. It greatly simplifies the process of collecting, storing and displaying information.

Since this current version of FileMaker will not operate well on a 386 with 4 megs of RAM it is a good choice for users who are not planning on upgrading their hardware in the near future. □

**Meet the Author:** John Numan is a consultant and database application developer at Executive DataGraphics, Tel: (800) 233-9939, email: John\_Numan@edgintl.com or to

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# GAMES FOR YOUR CHRISTMAS STOCKING

Matthew Cusack

## In the 1st Degree

Publisher: **Broderbund Software**

San Francisco, hometown of Gilly Hardy and The Grinch! Deal, is a city with a pretty decent murder rate. It is the perfect setting for Broderbund's first computer-based release since *Myst*. The game puts you, game prosecutor Sterling Cragston, in the task of putting a killer behind bars.

In the 1st is a full-screen video investigation, what the public likes to call "interactive entertainment." I like to call it, "interactive Mashed!" and it's almost as boring as the Mayberry lawyer himself.

The 1st is a game, it's a product made for a new type of computer user, one that thinks "multimedia" and "connect" the "net" are cool but playing actual interacting computer games is for computer nerds. This game is best left non-interactive.

The video's smooth, the sound is sweet, but the poor design leaves me pulling my hair out. This game is decided by conversation choices and so we've have to make the right choices. So much simple but sometimes, seemingly

innocent choices end up making your witness stand out of the room as an uncooperative fairy. Sometimes the choice seem so poor that no one but the designers would pick them, but these answers produce better results. Another problem with this game is it's really short, and the game must be played through 3-4 times just to figure out all the right questions to ask to obtain a guilty verdict. The problem is it's the same story each time and a good boring really fast.

The verdict is, if you've got money to burn don't let me discourage you from trying this game, but for most people the price tag's too much for this tiny sliver of the Broderbund ideal (I wonder if they've ever heard of replay value).

## Star Trek: the Next Generation: A Final Unity

Publisher: **Spectrums HoloByte**

...the mission, to finally get where no game has gone before. "...a dream goal but the quest for the perfect adventure game doesn't end here as unfortunately.

A Final Unity is Spectrums HoloByte's first venture into the adventure game genre. And they've really gone all the way with this product, it has all the SVGA graphics and digital sound any wild blooded Roman could wish for. All of the major characters from the television show have lent their efforts and have added quite some pretty decent performances. It even really compares up all of the details of the "trek" universe right down to the starbase on Krypton 5. The most important thing though is that the gameplay is there.

Your goal is to save the stranded Unity Device, an ancient weapon of a deadly race with  
(Continued on page 37)

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# Three Programs and a Freebie Enhance Win95

## Information

### Product: Name-IT

Publisher: Versoft  
4 Embury Avenue, Suite 307B  
San Francisco, CA 94111 USA  
800-255-5875/800-268-4769 (toll-free)  
San Diego, CA 92115

### Product: Quick View Plus

Publisher: Best Corporation  
401 North Wabash, Suite 400  
Chicago, IL 60611 USA  
(312) 624-0000/(312) 676-0000 (fax)  
List price: approx. \$35 (US)

### Product: Arcade Backup-95

Publisher: Arcade Software Inc.  
708 First Commerce Park, Suite 1  
San Luis Obispo, CA 93401 USA  
800-763-4680/800-944-4020 (fax)  
List price: \$29 (US)

needed of 8-letter file names (with no spaces, please). It allows for file names as long as 256 characters (even the Mac only allows 32 characters)—I've seen student "messy" files that were closer than that.

Unfortunately, this is only supported with new 32-bit, Win95-compatible software. You existing Windows programs are still only aware of the old, 8-letter version—and so a word processor file named "Letter to the Editor about Taxes" will appear as LETTER-1.DOC if you're using last year's Word 4.0.

Symantec Norton Navigator includes a feature allowing old Windows programs to set long file names—but it only works with programs using Windows long file names, and a few others. It doesn't support the popular Microsoft Office programs, for example.

Versoft's Name-IT is a simple program that does this single thing—but it does it well. When running, it adds long file name support to virtually all old Windows programs. If the program uses the Windows 3 common dialog box (as for Open and Save As), it replaces them with their Windows 95 equivalents, complete with long file support. If your program uses private dialog boxes for these functions, it adds a "Long File Name" button onto the dialog box—pressing this opens the Windows 95 dialog, again allowing long names.

It worked with all the old software on my system—allowing me to use the useful (and long overdue) World feature, without having to update all my software to new versions. (Nice how-

Alan Eisen

Windows 95 is a big step for word in features and stability over the various versions of Windows 3.1 that have gently made defined personal computing for the first half of the '90s. It has a friendlier interface, long file names, more-in-less plug and play hardware support, and is more powerful and less unstable than its predecessor. (Or as cynics are saying: "Windows 95 makes less.")

Its interface is good enough that it's taken most of the steam out of the formerly thriving industry creating software to enhance Win 3.1's ancient Program Manager, Symantec Software, for example, is touting its "Win95-compatible" Norton Navigator as something to enhance Windows 95's features, rather than to replace Windows features, as it did with the Windows 3 Mouse and PC Tool's Desktop programs.

But as Windows 95 is, there remains room for enhancements, and a number of companies are producing products to fill in some of Windows 95's missing pieces.

### Versoft's Name-IT

Take long file names, for instance.

Windows 95 finally breaks with the 1980 DOS



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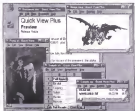
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over, this still isn't NOT all you can safely use either utilities such as defragmentation optimizers or backup programs without risking damage to the long file name extensions! My only wish is that the program could be run, needing its own taking up valuable Terabyte real estate.



### Quick View Plus

One of the new skills for Windows 3 is to right-click on everything. New computer users may find this easier than upgrading from Windows 3.1, for which the right mouse button often seemed as little used as an appendix.

Right-clicking most things brings up a pop-up menu, with some commands to the selected object. Right-click on some data files in Explorer (or My Computer), and one of the menu items says "Quick View." Choosing this brings up a handy view of the contents of the file, without needing to wait time for opening up the application that made the file. This is especially handy if you don't actually own the application that created the file, or if you want to check a bunch of documents to see if they're desirable. (If you installed Win 95 from floppies, Quick View wasn't installed—it's on the CD version only.)

Dynamic thought highly enough of this feature, that even though it's present on Win 3 products, the PC Tools File Manager, included a comprehensive set of document viewers, it relies on Win95's Quick View to provide for some features in the new Norton Navigator.

The only problem is that Quick View only provides viewers for a handful of file formats.

Isao Copkinson, who actually provided Quick View to Microsoft, in the past has been known for the excellent Outside-In utility, which provides a huge range of file converters. They are maintaining a replacement for Quick View, called (surprise!) Quick View Plus.

Instead of the 38 viewers included with Win95, QVPPlus lets you view over

200 document formats—virtually all of the common DOS and Windows word processing, spreadsheet, database, and graphics formats, and even several of the more common Mac formats.

Replacing Quick View in the right-click menu, QV Plus does a good job of showing fonts, line spacing, even, in many cases, embedded graphics. It will even let you view the contents of compressed ZIP files.

It can be used with a read-in Microsoft Exchange—e-mail that now can contain graphics or other binary attachments. Or it can be used together with the Scan Master's FIND command, which is fast a file or even to find a file containing a particular text string. Once you've viewed the file, if you want, you can print, directly from the Quick View Plus window—even if you don't have the original application that created the file. If your viewed file contains an OLE object's icon, that too can be viewed.

Graphics files can be cropped or resized, and the displayed can be used to copy and paste all or part of a document into a Windows application. Individual files within a ZIP archive can be viewed, copied, or moved—all without opening the archive.

Get used to right-clicking—it's one of Windows 95's hardest features. And if you find the range of viewers that ship with Windows 95 limiting, take a look at Quick View Plus.

### Arctide Backup

One of the big areas of complaint from Win95's upgrade has been backup. Hopefully, we all know about the importance of maintaining current backups for protection against viruses, power failures, theft, and other computer disasters.

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Older backup programs, like other disk utilities, however, are incompatible with Windows 95's long file name structure. Win95 includes useful alternatives for older disk utilities—ScanDisk and Defrag both work well, and should be used in place of older DOS or Windows equivalents.

There is a backup program included with Windows 95 as well, but it seems like the weakest of the bunch—written by tape drive manufacturer Compaq, it provides support for some Compaq drive models, but does not support most of the wide range of tape backup units available. No SCSI support for example. (Of course there's no support for floppy backups.) In the era of common 100 meg + 1 gig hard drives I doubt to think of a number of floppy disks needed for a backup.

Acronis are backup specialists. Their earlier products have been licensed to other software companies, appearing under well-regarded names such as Norton Backup. Under their own name, they have marketed higher-end products aimed at network managers, and alternative operating systems, such as NT.

Acronis Backup for Windows 95 claims to support all tape drives commercially available today, the wide range of DLT2000 (QIC 80) tapes, the new high-capacity Travan tapes, SCSI tapes, parallel port units, and more. It uses Win95's networking and multi-threading abilities to speed up backup even while the computer is being used for other tasks.

An included Backup Wizard walks the user through the setup, allowing customizations. Backups can be automated allowing them to take place late at night, for example. As a true Win95 program, it fully supports the long file name structure. An well-thought thought has gone into dealing with the Windows 95 System Registry.

The Registry is the central repository for data about the hardware, software and users on a particular machine. It can pose problems with backup and restore processes if new hardware or software has been added since backing up, causing the backup itself to result in a loss of the new settings.

Acronis 95 handles this by treating the Registry files differently than other data files—these aren't simply copied, instead, they are compared line by line, with the existing file—mitigating potential danger. Specific choices can be saved, allowing users to save a set of parameters for a minimal daily backup

and a more comprehensive weekly backup, for example.

The program is a must for anyone who values their data or their computer's setup under Windows 95.

### Power Toys— the Freebies from Microsoft

Not to be left out, even Microsoft is enhancing the basic Win95 product. We've previously reviewed Microsoft Plus!—the \$49 add-on that a number of the Windows 95 interface programs have been working on their own time, and created a collection of little utilities that Microsoft felt out. These are being distributed for free, by Microsoft, and other on-line sources, as PowerToys. (By the way, there's more news of you have Internet access.)

PowerToys have been updated every few weeks, but as of right now, includes a number of useful enhancements. Several features are added to that handy right-click pop-up menu, for example, you can now view media from big, compressed \* C4B files that came on your Win95 CD or deletion, and easily find a particular file. Even allow it the addition to the SEND TO sub-menu— by default, right-clicking on a file gets you a SEND TO choice, allowing you to send a file (or files) to the A. drive, or to a few programs. (Win 95 BENT— copy shortcuts of anything to the WINDOWS\SEND TO folder and they will appear on the SEND TO list— add photos, fax, applications— whatever you want) Power Toys also SEND TO ANY FOLDER when making a the easiest way to copy or move files in Explorer.

There are some nice enhancements to the media-CD player New to PowerToys, is perhaps the most powerful feature of all—Thumbnail. This results in a Control Panel icon, and allows the user a huge range of customization features— removal of cluttering desktop icons such as Network Neighborhood or the Recycle Bin, for example— or an easy way to get rid of the Cried screen at least up.

Lots of features, and the price is right. Anyone who wants more power over the Win95 environment should take the time to track down and install a copy of this one. ☐

Along the author, Alan Homan is a writer and an associate editor of Computer Player. He can be reached by e-mail at alan\_homan@compuserve.com

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# The Lowdown on ISDN

Sean Elington

phone system. After all, even if you have a Pentium 100 and a 28.8 modem, your ability to enjoy cyberspace is totally dependent on the ability of your residential phone line to carry data. A poor quality phone line will make surfing the Web a painfully slow experience. Dis-

ing an expensive, high speed, dedicated data line has always been an option for businesses, however until the advent of ISDN there was little hope that the home user could ever really fly along the Information Highway.

To understand ISDN (Integrated Services Digital Network) we must understand the difference between an analog and digital telephone line. Analog telephones transmit electrical impulses

of varying intensity to a remote form - if you speak louder the signal is stronger. Digital systems carry zeros and ones and the intensity of the electrical signal does not change, because all of the information is contained in numbers represented by the zeros and ones.

When you connect to your Internet provider the sequence of events usually goes something like this:

1. Your computer sends a series of digital zeros and ones which then go to the modem.
2. The modem takes these binary digits and converts them into an analog wave form. This signal then goes to the local telephone company switch or central office (CO). The switches are located around town and are really just very large computers.
3. At the switch, the data is turned again into digital form and transmitted at high speed to the CO nearest your Internet service provider (ISP).
4. The call is then converted back into analog form and transmitted to the ISP's modem pool.
5. It is then converted back into digital again so the ISP's computer can deal with the information.

As it can be expected, valuable data is dropped during the numerous switching to digital conversions and must be resent - causing further delays.

The telephone line between your home and the Internet telephone switching station is called the local loop and is typically analog. Starting in the late 1980s, telephone companies around the world changed their "local loop" - lines between switches - into digital systems since they are capable of carrying more information more reliably than analog lines. However, the telephone companies have always balked at the cost of replacing literally millions of miles of local loop analog copper wire with special digital lines in every home.

ISDN extends the digital trunk lines between COs all the way to your home, obviating the need for a modem. It has always been possible to do this if one was willing to pay for an expensive dedicated data line to be installed. ISDN allows you to, in effect, turn the existing analog lines already in your home into digital telephone lines through software installed on the nearest CO switch. Suddenly, your analog telephone line, which might as a good day actually run at 20,000 bps, now can send and receive data at 128,000 bps.

The cost for this service is between \$70 and \$100 per month per line depending on which service plan you decide to use. The cost of ISDN is coming down rapidly in the North America - in California, for example, you can get an ISDN line for about \$25 per month.

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ISDN uses each of the related pair of copper lines already in your home to send and receive 14,000 bits of data per line. If you "hook" the two pairs together you get 28,000 bps. The two lines are called a BRI (Basic Rate Interface) or 2B+D. The "B" are the bearer or data lines and the "D" is a logical data line for carrying signaling information (the phone's control signals) as well as set up a call. If your ISP supports ISDN they might have a number of BRI lines installed so they might have paid a lot of money for a PRI (Primary Rate Interface) which is 23 B channels and 1 D channel combined into one physical phone line.

To terminate a BRI you require two devices - a Terminal Adapter (TA) and a Network Termination unit (NT1). The NT1 supplies power to the line and turns the two wire line into a four wire interface. The TA performs the encoding and other control functions on the line. The ISDN line comes into the NT1 and then goes to the TA and finally is connected either directly to your PC or to a serial-to-LAN A/D card with a TA/NT1 combo about \$400, while a router which has a built-in TA/NT1 can run as little as \$1800. By itself an NT1 costs between \$250-\$350.

So why doesn't everyone use ISDN?

BCTI has been much slower to roll out ISDN services than other providers.

BCTI's major shareholder is a large American company called GTE which makes telephone switches. Over the years BCTI has bought a lot of these switches, which, unfortunately, do not support the software needed for ISDN. BCTI is slowly replacing these GTE GTD switches with ISDN capable switches from Northern Telecom and AGAT. The cost of replacing multi-million dollar switches means the deployment of ISDN is limited to urban areas. Downtown Vancouver and parts of Victoria, Kelowna and a few other cities already have ISDN access. The normal way to see if you can get ISDN is simply to call the telephone company and ask them.

Your ability to receive ISDN depends on which switch you are using and the distance you are from it. Generally, to get it you must be within 5.5 miles of an ISDN switch, although the phone company is actively trying to extend that range.

If your thinking of using ISDN you should be aware that you might need to replace your old analog telephone and fax machines since they will not work on a digital line. One way around this problem is to look for a TA/NT1 with analog ports that you can use to support your existing equipment. Some vendors have introduced products which combine an ISDN TA/NT1 with a V.34 modem so that customers will have a smooth transition to ISDN when it becomes available in their area.

Some providers, like Canada's 1343 Edge Router allow you to send a fax, take a voice call, and send and receive data all at the same time. If you doing a data transfer the router will buffer 64K B channels, but when you pick up the phone, a software can take care of the other 64K channel to send data. When you are finished your call it automatically starts sending data on the both lines again.

In my next article I will discuss Frame Relay and T1 lines. ☐

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# Stuff for Christmas

Alan Zisman

**T**hinking of a gift for that special computer-user on your list? Computer users can be notoriously difficult to buy for—especially if you're not particularly computer-savvy yourself. Too many well-

intentioned computer-armed gifts can end up being the high-tech equivalent of that tin of marmoset destined for the back of the closet.

As with other gifts, the most appreciated are ones that are picked out with some thought on the needs, wants, and, most of all, tastes of the recipient—too

many of us buy gifts that we'd like, rather than ones that we know the recipient will like.

[You can always try this technique—ask them! Or get a gift certificate from the computer or software vendor of your choice.]

If you don't know exactly what they want, make sure you know a few things about them and their computer first—how old are they? Are they game players? Do they use Macs? PCs? Amiga? G3? There are few things more embarrassing, saving, computer-gift giving, than giving software to a computer user that will only run on a different platform than theirs!

Some gifts are universal—boxes of floppy disks, for example. A little bland, perhaps, but always useful...and virtually all computers can use the same 3 1/2" diskettes. (Some of you may wonder: Why give for a stocking stuffer? Take a look at these computer and workplace...is there something flimsy? Covered with coffee stains? Some even start at under \$5, but for \$15-20 you can get an especially nice one (again—think of their tastes, not yours!) You can even get packs with a print of their favorite photo or graphics.

Buying software for someone else can be pretty tricky, unless they've dropped pretty specific hints about what they want (Fox, Mon, the SanCity 2000 run looks neat!) Games, word games, comics, and even tape spins are gifts—but they're like buying marmoset—there are lots of different tastes and shapes (and as always, make sure you get something compatible with the computer platform—giving a Mac user a Windows program is sort of the giving a mouse on a beach tape for their CD player).

You might want to get a subscription to a computer magazine as a gift, but don't just push the first one on the shelf—like lots of other areas of publishing, computer periodicals have gotten increasingly focused: there are magazines for PC users, Mac users, etc., for beginners, for programmers, for the technically oriented, for game-players. If we covered half a dozen magazines

specializing in the Internet. Again, try and think of what *how* the person getting the gift uses her or his computer—especially when they're NOT at work. This makes sure they don't already get that magazine.

Recently, I went Christmas shopping at a computer superstore with Sammy Ho, Jim Edwards, and my eleven-year-old, Lucy. We were searching for gifts for various age ranges, and at a variety of prices—the sort of things that could be fun, maybe a little quirky, that our favorite computer users might like, but often couldn't justify buying for themselves.

## For The Kids

Software that is both fun and educational (educational?) is a pretty hard act to follow—but most of it is now only available on CD-ROM. Make sure the child's computer has a CD-ROM drive before buying these. Classics include Bradford's Living Books series, and Microsoft's Magic School Bus. For the very young, there have been gifts by Fisher Price titles, such of Fisher Price's 1014. Prices range from \$45 to about \$70. For somewhat older kids, check out The Learning Company's offerings (also available on floppy disk) such as the various SuperScience programs (about \$50). All these programs have the suggested age range on the box—make sure you get something that's age appropriate. All these programs have both text and PC versions.

Small children who have problems with adult-sized mice, particularly the super-jumbo models such as the cone-shaped Microsoft Mouse. Smaller is as small as around \$10 for a model from Genius, while both Microsoft and Logitech have offerings aimed at home or children for about \$40. There are even colorful replacement keyboards, among a younger computer user.

Popular games with all ages the season include the new 1994 version of NHL Hockey and Moral Combat 3 (both about \$70). At the same price, corporate an CD-ROM with IBM's Qix2 Fun Pack.

Like buying high price of games, make you want to make sure as gifts, there are more and more available at a relatively bargain price. For example, you may be able to find remasters of older software, with a sub-\$20 price tag. I saw products like Chuck Yeager's Air Combat, and a PGA Tour Golf World Tour Tennis combo at that price range. Console fans might enjoy the X-Men Interactive CD, also at that price.

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If your special someone hasn't yet added sound to their PC, a sound card such as the Sound Blaster 16 Value Edition will cost \$149—but add to that the price of a pair of speakers... from \$30 on up. If they *do* have a pair of \$30 speakers, you may want to improve their sound quality—better speakers, while a sub-woofer for more impressive lows,

start about \$99 and can go up to about \$170 or more.

If optical drives to be added, what could be more practical than a surge protector? Is the computer safe from power surges or lightning bolts? How about the modem, or the phone jack? Very cheap powerline-type surge protectors are actually pretty useless, but models that do

protect start at \$35, with more protection available for about \$100 or so. Make sure there are phone plugs for those modem lines.

Notebook users would appreciate a bag for their computer, with room for some file folders, cards, disks, modem, and all. Colorful cloth models start around \$30, with prices going up to \$200 for leather binders.



Then there are the gadgets and gizmos. Scanners allow users to digitize pictures and text—getting them onto their computer screen where they can be added to documents or manipulated in all sorts of wonderful and wacky ways. Black and white ("gray-scale") models start just over \$100, while colour models costs closer to \$300. For the same price, check out floppy—a little unit that lets you capture still shots from a TV or video player. One bargain find is the Comcaste QuietCam—priced \$138. This plug-and-play gadget is a good option because that plug line is computer-allowing, still or full motion (black and white only—what do you want for \$100?) shots. The Windows version may be in the store by the time you read this—the Mac version should be available soon.

Upping the price point, there are more and more gadgets—tape backup drives for under \$200, for example (if you're already too lazy, a couple of tapes are more affordable, but still appreciated gifts). A cordless mouse from Logitech, for \$137 to get rid of some of those desktop wires. An \$50 meg hard drive for \$600 or so.

Or if you're nowhere near those price ranges, here about decorative fun paper! Lots of different styles, about \$10 a pack. In fact, special Christmas paper for \$3 a pack. You can have great-looking forms on an interesting, pre-printed background.

As you can see, there are a wide range of presents available at various prices for computer users of all ages. If I haven't shown you enough ideas here, check out Megamix X or NILL looking for (Are you reading this Grandma?) its for me! Oh, anything will do, thank you. ☺

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# STING A Final Unity - details are there for the patient

(Continued from page 44)

Immense power, just make sure you find it before the Klingons. There are plenty of other smaller missions and objects to keep you busy as well, as any Starfleet graduate would know. Take over the helm and send the Enterprise into warp 9.3, or command the tactical display in the middle of a planet's daylight, and there other posts in command as well. Too bad you can't really go anywhere but the bridge.

When the time comes for an easy mission, pick your team carefully. Of you're a cadet just into who they give you. Every team member has certain skills. Data and La Forge can give you info on scientific or technical subjects, Worf is a good shot with a phaser, and Tric can give you insight as to when the others you encounter are thinking.

Don't hesitate to ask them for advice because you'll usually get a pretty straight answer if you do. Everything should be scanned as only a tricorder can reveal an object's true purpose.

This game does have flaws though. As with most adventure games it finds

Unity is packed with standardised puzzles/mazes and meaningless dialogue. If you thought an episode of Star Trek could drag on, well tell you see this game, it is too often seriously slow.



it once loaded, on my 486-33 w. 8 Mb, five minutes staring at the screen while the ship moved to another sector at maximum warp!

The verdict is, if you have the patience and enthusiasm for the Trek universe necessary to complete this game, then maybe this game is perfect for you. □

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### Business on the Internet

There's something we all like to do in the physical world. Something we all want more of in the web. A good internet marketing strategy can generate excellent volume and maximize customer traffic. For those who start, you have designed an attractive and appealing web site with excellent information about your company and industry. For those wanting to do business, you must now accommodate the needs of those who approach.

A well designed site will already have incorporated different ways for potential business to approach. There can vary from simply advertising as 1 800 number to integrating elements of consumer psychology right into the interface of the site. Design your budget. It is imperative to supply more than one reason why people should contact you instead of the site or other sites they may visit. This may be accomplished through cross-promotional strategies with traditional media, online games or products, an excellently designed electronic shopping interface or joining a forum or mailing list. Regardless, interesting and easy ways for potential business to communicate with you is a must.

### Communicating Across the Internet

When someone phoned your business they can connect to another person and usually deal directly with someone (synchronous communication - no delay) who can help them. With e-mail much the same as voice mail there is no direct contact (asynchronous communication - store delay) and the need for prompt response becomes dramatically. It may not be that you respond to e-mail immediately, although when contacted most mail programs will alert you when you have new mail, however when it only takes a few seconds to send e-mail across the globe a prompt response is expected. Many businesses check their e-mail at regular times (8:00am, 10:00am, 1:00pm, 3:00pm) so often you receive a response the same day.

Mailing lists and automated mailboxes are a great way to provide lots of specific information that may be easily passed over on the web. They can also provide an added value to the content of your web site and to the services your company offers. With the recent influx of users onto the net more businesses are specializing about the features of Usenet newsgroups. The replacement? Private mailing lists, Interviews and Forums. Create an e-mail newsletter that provides up-to-date industry information and intelligence, more



the web. It functions identically to an Usenet newsgroup yet exists solely on the web. Industry related topics can be discussed, market feedback or public opinion can be gathered by interacting with others on-line. Universities across North America were using the Internet for exchanging ideas, soliciting opinions, tracking data and other functions long before business got wind of the concept. Going online to gather strategic information and learning about markets is as easy as creating a forum for discussion and allowing people to respond with their knowledge and experience.

### Communicating Within Your Company

Web technology can also be used for some dynamic methods of communication. Companies with offices spread out geographically can now keep all touch in steps even before possible. Remember the e-mail story? I have had business conversations through e-mail with people in Seattle. There is a few messages back and forth and we had accomplished the same thing we would have in the phone and fax but with less expense.

Think of the virtual download. Over the weekend you receive an e-mail message telling you to look over a presentation on the web. The URL is listed within password directory to a protected area. You enter the password, press the enter button and watch as a message appears and is replaced by another periodically giving you a brief synopsis of what you're about to see (former publication path) take a look at this site for an excellent example of push/pull: <http://www.internette.com/html/cade/cade01.html>

After the initial synopsis is finished you now have the opportunity to make your way through an interactive business project on the web. With the recent advances of Message 2.0 the you now are enjoying real-time interactivity with no page slow loading. (<http://www.message2.com/>) Graphs are animated to show changes in the market, but moves across the screen without you clicking on anything and the presentation starts to a close with a video giving you in response individual responses in a format online. Suggestions and criticisms are posted and analyzed by everyone.

Monday morning you sit down at your desk checking your e-mail and there is a confirmation message of your presence on the site during the weekend. A final report summarizing the objectives and activities gathered on the web comes as an attached file with the mail. A discussion the project with assigned notes has been made and you will be notified of the overall project management meeting.

Web technology is already being used internally in many companies. Automated web page creation, adding databases, sound or video presentations make the web the ideal medium for managing departments or coordinating communications between departments on key projects. A following and taking previous or relevant information from other projects is another excellent time saving resource that can be accomplished on the web.

Web technology is advancing at an incredible rate. Accommodating many new features every few months, companies now have the opportunity to conduct business in ways never before available to them and in time of advances only network infrastructure will be a slow and cumbersome road to successful reach. A slow and tedious road that he spoke with his computer consultant. The consultant told him that his business probably would not benefit from the web for another six months or so and to hold off developing a web site. Would it not make sense to develop some sort of prototype of this idea? To launch a site yourself with the consultant as preparation for that time? Would that not give you an advantage over your competitors when the time is right? Thinking like that consultant could leave you trailing your market instead of being ahead of them. Missing opportunities that find arise from doing business on the internet.

Next month we'll look at online transactions (B2C, secure socket layer), commerce servers and digital cash.

About the author: JIM MILLER is a principal of Vancouver Internet Publishing and can be reached at [jim@vip.com](mailto:jim@vip.com)

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## Charitable Giving With An Advantage

Richard K. Adson

With the season of Christmas giving coming and year-end tax deadlines on our minds, Bruce Mayhew, C.F.A., an associate in our firm and I recently had a discussion about charitable giving. I thought some of the points in our conversation would be useful for many of the readers of this column. Knowing that Bruce had developed knowledge in the area, I asked him to write this month's column. The subsequent paragraphs are Bruce's thoughts on this issue. If you wish to reach him to discuss any of these matters further in business terms, which you will find at the end of the column, is the same as mine.

Charities are everywhere. Chances are you've been asked to donate to charities at work, on the street, and in your home. With such a demand for giving, and for most of us, such a limited amount of resources, it is becoming more important to plan your contributions to ensure your dollars reach the charities that mean most to you.

Charitable organizations too must plan their spending. As funding available through government sources is reduced, both the dollars needed today and in the future become more crucial to the continued existence of the organization. Charities are looking not only to "passive gifts" or cash and non-cash assets, but also on "deferred gifts" of major contributions that will allow them to more accurately forecast their funding for the future.

Not only can giving to charity be personally satisfying, it can also be beneficial to our lives. If you want to take advantage of the tax benefits of charitable giving, individuals must first ensure their chosen charity is a "recognized charity" as determined by Revenue Canada. In doing so, an issued "tax receipt" will be valid and can be used as a "tax credit" from income tax that would normally be paid.

Secondly, decide on the method and amount of your contribution. A cash donation will enable you to take a tax credit equal to 17% of the first \$200 donation and 29% of charitable donations over \$200. When the provincial tax is calculated the combined effect is approximately 25% on the \$200 and 44% on the excess. There is a tax limit of 20% of an individual's net yearly income.

Corporations may also deduct 20% of their taxable income. If you are the principal shareholder in a closely held corporation and are considering a sub-

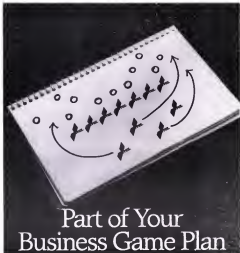
stantial donation, you should meet with your Chartered Accountant to determine whether a contribution by yourself, your corporation or both will provide the best results from an income tax perspective.

"Gifts to the Crown" or "gifts of certified cultural property" are NOT limited to 20% of net yearly income and therefore could effectively reduce an individual's income to nil. "Gifts to the Crown" are defined as those made directly to a government body such as the National Gallery, a university or hospital foundation (such as the B.C. Cancer

Agency) or to the federal government or a provincial government.

Charitable donations made through payroll deductions are a relatively painless method of contributing to your chosen charity. By donating small amounts on a regular basis, the overall contribution can be sizable. As the donation ap-

(Continued on page 65)



## Part of Your Business Game Plan

Every company needs a plan, a game plan for business success. Without it, your business might not even survive, let alone make it to the playoffs.

That's why ITEX barter should be part of your plan. Successful businesses across America are using barter as an integral part of their business strategy, and ITEX is the nation's leading barter company.

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So make ITEX part of your business strategy. When the playoffs are over and your business emerges a winner, you'll be glad you added ITEX barter to your business play book.



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## Charitable Giving With An Advantage

(Continued from page 43)

years on your T4 slip you don't have to worry about multiphased receipts.

In addition to these personal gifts of cash, charitable organizations also receive non-cash assets as donations. These would include such items as land, suspension chairs, or art. The donor would receive a tax receipt equal to the fair market value of the asset.

A growing number of individuals are choosing "deferred gifts" as their preferred method of donation. This refers to gifts arranged today but not received by the charitable organization until some time in the future. Deferred gifts include life insurance policies, wills, annuities, and trusts. They can be relatively easy methods of giving that do not affect your current standard of living.

Life insurance policies can be attractive for both the donating individual and the charity and can be accomplished in two ways. First, the donor can sign over an existing policy that is no longer required for its originally intended purpose. In this case the cash surrender value is tax deductible. Alternatively, a new policy can be purchased

with the charity being named as the sole owner and beneficiary. All premiums paid are deductible for income tax purposes.

Wills or bequests are a popular means of donating to your chosen charity. There are Gifts of Residue, Fixed Sum Gifts or Gifts of the Whole Estate. Such bequests are eligible for tax credits and can considerably reduce estate taxes payable after death.

Money or property may also be transferred to a charitable organization through trust provisions. Under the trust's terms, the individual maintains the use and enjoyment of the property until death. When the property is transferred to the charity, it has receipt equal to its present

value as stated to the donor.

Remember if you want deduct 10% for 1993 you need to make your contribution by December 31st and ensure the receipt you receive is properly dated.

With proper planning and sound financial advice, it is relatively easy to make a personal or long-term commitment to charitable giving without affecting your current lifestyle. Whenever making your choice, seek the advice of your Chartered Accountant, before-hand to ensure you receive the tax advantages you deserve. □

About the author: **Richard E. Jones P.C.A.** is with *Acute Charitable Chartered Accountants*. He can be reached at (416) 734-8772 or (416) 734-0217.

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## John Madden

In many respects, choosing to own a business is a lifestyle decision. People buy or start a business because they want the freedom, the flexibility, the status, and the rewards that go with owning and building a business. All too often the dream ends differently.

As some point people frequently discover the business wasn't what they thought it was going to be, and the employees are the ones with time on their hands and the money to repay it.

It doesn't have to be this way for business owners that put all their business resources to work and focus on process.

#1 Business people must remember their working harder and longer are poor substitutes for working smarter. Time to enjoy life will be there for the business owner who plans and manages for it.

#2 Owners must always keep in mind that when day-to-day business success is measured, cash flow is king. If there's money in the company to pay the expenses and leave a surplus besides the enterprise will do well and business owners will have more time when there are fewer crises to manage.

Barter can't help with the list of these other than helping business owners find a business coach or time management trainer on track. However, when it comes to controlling a company's real cash flow, barter itself is king and ITEX is the preeminent leader in world barter networks.

Visually every business has some kind of a surplus, whether of product, reliable hours, or production capacity.

The surplus may manifest itself on a regular basis, or appear periodically like the potential delays in making or the off season slack periods in the travel industry.

Companies belonging to ITEX Barternet can sell this surplus for Trade Dollars. Frequently, these Trade Dollars are used to pay business expenses, however, that's not the only way they can be spent. Another way is to improve the standard of living of those who created them later and resources to building the business in the first place.

Many business owners might be inclined to take a substantial amount of cash out of the business to go on a luxury vacation or to pamper themselves with expensive possessions and entertainments. On the other hand, Trade Dollars are earned selling the company's surplus, so Trade Dollars represent value the company wouldn't have otherwise had.

Partly because it has such an extensive network, ITEX can offer to members a wide variety of vacation destinations, recreation and entertainment opportunities, and luxury products. Many members take advantage of these offers largely because they say they are earned from their excess rather than from the cash the company needs to prosper and grow.

As the ITEX global network continues to expand, there will likely be many more opportunities to live better with barter. □

About the author: **John Madden** is a Chartered Accountant by profession, is President of ITEX Barternet and may be reached by E-mail at [john.madden@madnettel.net](mailto:john.madden@madnettel.net) or by fax 313-7944.

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